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The Humane Slaughtering of Animals.

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(Presented to the Central Veterinary Society.)

The question of the Humane Slaughtering of Animals may, I think, be properly regarded as one of the burning questions of the day. I suppose there are some people who consider it wrong to take life in any circumstances, and to them slaughter by any means whatever implies cruelty. I do not propose to discuss that point of view at all, but to begin with the assumption that the slaughter of so-called lower animals at various times and under various conditions is inevitable, either for humane reasons in order to abbreviate suffering from diverse causes or to provide food for man.

Taking that assumption for granted, it behoves us to carry out such slaughter in the most humane way possible, consistent with the circumstances of the case. By this I mean that the slaughter should be carried out in such a manner as to prevent all avoidable pain and suffering, both before and at the time of slaughter. With regard to the use of the word "humane" in this connection, I would in passing voice my serious objection to its adoption by various individuals in such a manner as to imply that they alone are possessed of all the virtues conjured up by the word "humane," and that everybody else who should disagree with the methods advocated by them are devoid of those most desirable finer feelings. I might be forgiven for pressing the point a little bit further, and stating that in my view there is no other collection of individuals that does so much to prevent and relieve pain and suffering as the veterinary profession. It is the daily work of most of us, and it must surely be granted that with our special training in comparative physiology and medicine and our lives spent mainly in association with the domesticated animals, examining them, appreciating and interpreting symptoms, there can be nobody more fitted to investigate and express opinions on the subject than veterinary surgeons. It is rather unfortunate that there are extremists—I almost said fanatics—in this matter, as in most others; they are actuated by the best possible motives, but their enthusiasm for "the cause" is so apt to warp their judgment, that they really do far more harm than good. Hence it is that I specially welcome the opportunity to bring the subject for discussion by the Fellows of this Society, so that it can be considered dispassionately, and in the absence of a brief for anybody, unless for the unfortunate animal to be dispatched. Moreover, as we are not in any way authorities on matters of law, I trust we shall also omit legal questions.

The subject naturally divides itself for discussion under two headings:—(1) the slaughter of animals not destined for food of man; (2) the slaughter of food animals, as complicated by the necessity for bleeding and the avoidance of any ill-effects on the carcase and tissues and their keeping qualities; and still further complicated by the large number of animals that may have to be slaughtered at the same place within a limited time.

THE SLAUGHTER OF ANIMALS NOT INTENDED FOR HUMAN FOOD.

The chief difference in the procedure in these cases is due to the fact that there is no necessity for the removal of blood from the carcase after death. The main point, therefore, is that the animal shall be slaughtered as quickly as possible and with the absence of avoidable pain. If some pain is unavoidable it must be of the shortest possible duration.

In the case of the larger animals (horses, cattle and large pigs) this is best accomplished either by means of the poll-axe, the eyes being covered by a cloth or other mask, or by means of a mechanical killer. The *poll-axe* is a most effective implement in the hands of an expert slaughterman, but is capable of inflicting the grossest cruelty in the hands of a novice. Hence, in my view, no man should be allowed to use a poll-axe for slaughtering an animal unless he has attained proficiency by practice, either on dead subjects or on a dummy provided for the purpose. There are several modifications of the poll-axe, each consisting of a bolt held in contact with the forehead of the animal, either by straps and attached to a mask (Bruneau Mask), or attached to a long handle and held by an assistant. The bolt is then driven into the head by a sharp blow with a heavy long-shafted hammer or mallet. In some of these appliances the bolt is also attached to one or more springs, by which it is immediately withdrawn from the head, returning to its previous position (Kleinschmidt's, Kurton's, Goodmar's). These implements are more certain than the poll-axe in the hands of the novice or inexpert, and are less likely to cause additional suffering as the result of mis-hits, and very little can be said against them. They produce loss of consciousness almost immediately, and death can even yet be hastened by the insertion of a so-called "pithing-cane" through the hole in the

cranium into the brain and through the medulla into the spinal cord.

Of the *mechanically-operated killers* there are three primary types, viz. :—(*a*) the spring pistol, invented by Pilet, in Holland, and improved upon by the R.S.P.C.A., also the compressed air pistol, invented by Ransome; (*b*) the captive bolt pistol, as introduced by Behr and improved upon by Cash; and (*c*) the bullet-firing instruments, first introduced by Siegmund, of Basle, with its various improvements, notably those of Stoff, Greener and the R.S.P.C.A.

(*a*) The two *spring pistols* mentioned under (*a*) may be briefly considered together, as they both consist of a captive bolt forced into the skull from the barrel of the pistol by means of a strong spring on the one hand and by compressed air on the other, and in each case operated by a trigger. The spring in the former is set by means of a lever. The compressed air pistol is charged by means of a motor tyre pump, the pressure being indicated by a gauge. These two instruments have a great deal to recommend them, especially with regard to small and medium-sized animals, and also in coal mines, where no explosive can be used, and where there may be insufficient space in which to swing a poll-axe.

(*b*) The *captive bolt pistols* referred to under (*b*) are both operated by a trigger and a blank cartridge, the explosion driving the bolt concealed in the pistol barrel into the skull when held against the animal's forehead or poll. The air compressed in the barrel causes the bolt to return, the explosion gases escaping by different exits according to the make of the pistol. And herein lies one of the main difficulties to be overcome in order to effect a necessary improvement. In the Behr pistol the gases escape down a hollow channel in the bolt and escape almost at the end, through two holes, into the brain. These holes, however, are rather apt to become choked with brains and blood, and by retarding or preventing the escape of the gases, the bolt is unable to return fully home. The result of this is that the full force of the explosion of succeeding cartridges is not exerted on the piston and loss of penetrating power produced. Cash attempted to overcome this defect by plugging the channel of Behr's pistol and allowing the gases to escape into a hollow circular silencer surrounding the whole barrel, and thence into the atmosphere. By this means plugging of the vents was avoided, but still the gases failed to escape rapidly enough to permit the proper return of the piston after it had been used a few times. Hence, after several cartridges have been fired, the pistol is temporarily ineffective and the necessary interval before it can be used again causes a rather tedious wait if many animals are to be dispatched.

With this exception, these pistols are very excellent for small animals, as sheep, young pigs, dogs, heifers, and ponies. I have seen them fail in bullocks, bulls, and large sows and boars. They would probably fail less often if kept clean and the piston greased more frequently.

(*c*) There are several *bullet-firing instruments* which have evolved from the original invention by a veterinary surgeon, *Siegmund*, at the Basle abattoir. This instrument, which was attached to a mask, caused a too-loud explosion, and Stoff improved upon it by abolishing the mask and providing a bell-shaped silencing chamber. This form was still further improved in the *Greener* and in the *Swedish killer*, each of which, in addition to the silencer, has an attachment to prevent accidental firing. In dealing with animals that are fairly quiet, these instruments are effective and very easily operated, but require the operator to stand in front of the animal, to hold the instrument in one hand against the forehead, and to tap the striking pin which explodes the cartridge with a mallet in the other hand. With a horse or any animal easily controlled this instrument is effective and safe to the operator. In the case of a very restive or a wild animal with long horns, however, the position of the operator straight in front is likely to be hazardous, and the *R.S.P.C.A. killer* is designed to overcome that danger, being so constructed as to allow the operator to stand away from the animal and at its side. It consists of a short pistol barrel with a silencer, and is fixed at a right angle at the end of a long wooden shaft. After the cartridge is inserted, the mouth of the silencer is held against the head and the pistol is fired by means of a wire running inside the shaft to a finger slot at the end. This is a very powerful instrument, and can be used for horses, large cattle, and old sows and boars.

The R.S.P.C.A. pistol is of similar design, without the long handle, and can, of course, be operated by one hand, and is more portable. Cartridges of varying power can be used according to the animal to be killed.

The Greener "Safeti" pistol is specially designed to avoid accidental firing. The barrel is made to slide, and when the cartridge is inserted, it is kept away from the striker by means of a spring. Consequently it can only be fired when the pistol mouth is actually pressed against some object as the head of the animal to be slaughtered, and is therefore safer for restive animals. It is specially useful for the smaller animals, as sheep, small pigs and dogs.

All the bullet firing instruments must be used with caution, as it not infrequently happens that the bullet is deflected after entering the cranium, and leaves the body at an angle, passing out at the back of the head or throat, or the side of the neck. In sheep and in dogs, if used at the poll, the bullet may pass straight through and ricochet from the floor. I have myself seen this happen in horses, sheep and dogs with a Greener, and obviously, if any person is struck with the bullet, serious injury may follow, the severity depending upon where the bullet strikes. If in a limb, slight injury only may result, but if in the orbit, an eye may be easily lost, even if the bullet is almost spent, while it is also possible for the cranium to be penetrated if the bullet is in strong flight. Cases of injury have been recorded (*Lancet*,

March 26th, 1921, and *Meat Trades' Journal*, April 21st, 1921, etc.), and I have also seen several people who have received bullets from such implements. Great care must be exercised, therefore, to see that nobody is behind the animal being shot. This can usually be arranged quite easily where one or two animals are being slaughtered, but it is very different if there is much business or many people about. The danger is not so much to the person using the instruments as to other people who may be unsuspectingly within a danger zone. It may be said that if the animal's head is kept quite straight, there is no danger, but it is obvious to anybody who has had much to do with the handling of animals, that this cannot always be done.

In order to avoid this risk, soft-nosed bullets have been introduced, and it is stated that they will pierce the skull and effectively stun the animal, but do not pass out again. Not infrequently, however, these bullets fail to pierce the skull, and a varying number of shots has to be taken.

I do not feel so much concern for the safety of the operator. Of course he may injure himself if careless or ignorant of the use of his weapon, or even as the result of accidents over which he may have had no control, but precisely the same can be said of any lethal weapon. If it be a knife he may cut himself seriously, or if it be a poll-axe he can miss his aim and actually break his own leg. These dangers are attached to the use of any method of slaughter. It is the third party who may have nothing whatever to do with the operation in question for whom I am more concerned. It may quite truly be said that large numbers of bullet-firing instruments are in daily use and thousands of animals killed without any accidents, but I should hold, and I have no doubt many of you here would also hold, that if it is only 1 in 50,000 or more that caused a casualty, that would be one too many if I or you happened to be the unfortunate victim. It goes without saying that human life and limb must be safeguarded.

In addition to stunning, other methods of slaughter are sometimes resorted to. In the case of the horse, *pithing* may be done between the atlas and axis by means of a long scalpel. The operation is facilitated if the poll is stretched by pressing the horse's chin in towards the neck. I have killed horses by this method, but I do not consider it as expeditious, nor does it produce unconsciousness so quickly as stunning.

The method of *internal bleeding* can be resorted to when circumstances permit. It consists of inserting the hand carrying a sharp scalpel with the blade protected by a little cotton-wool or special sheath into the rectum as far forward as possible. The guard is then slipped off and the knife plunged upwards into one of the large iliac arteries. If a fair incision is made, there is very rapid hæmorrhage into the abdominal cavity, the operation is almost painless, and loss of consciousness is fairly soon produced owing to the hæmorrhage. Moreover, no blood is spilled outside the body. This appeals to me as being a far more humane method than pithing, and very suitable in certain emergencies.

Dogs, etc.—With regard to the humane destruction of dogs and cats, my mind is really divided as to which of several methods is the best, viz. :—shooting with a small captive bolt pistol, the injection of a full dose of hydrocyanic acid into the chest, or the hypodermic injection of a full dose of morphine, to be followed in half-an-hour with chloroform, either by inhalation or injection into the uplifted nostrils as suggested to me by Mr. J. Willett. The quickness of dispatch is in the order named, and I am disposed to place them in the same order as to merit. Other poisons, such as strychnine and arsenic, are sometimes used, but I consider them both very painful and cruel.

Various types of lethal chamber are available. Most of them require the use of some gas, as coal gas or carbonic acid gas. They are really asphyxiating chambers, and in my view far from humane.

Electric chambers are quite good if the voltage is high, dogs and cats being electrocuted in such chambers almost instantaneously.

The Slaughter of Animals for Human Food.

As already indicated, the slaughter of food animals is complicated by the necessity for bleeding and the avoidance of any ill-effects on the carcase. This opens up a very important field for discussion.

The necessity for bleeding lies in the fact that blood very quickly decomposes, and, if left in the carcase, very materially reduces the keeping quality of the meat. The best keeping qualities are obtained by a rapid and complete bleeding, and this is best effected by severing the large blood-vessels of the neck. The rapid loss of blood very quickly brings about loss of consciousness or fainting, owing to the resultant anæmia of the brain, while respiration and the heart's action are maintained a while longer. If the sticking is carried out expeditiously with a very sharp knife, there is comparatively little pain, and what there is is limited to the skin itself. It is desirable that respiration should be maintained during the bleeding, so that proper oxygenation of the blood and tissues can be carried on to the last. When stunning is carried out, the action of the heart may be somewhat inhibited, though syncope from the shock is occasionally produced. If the injury involves the medulla, as is the case with pithing and with bullet firing instruments, respiration almost immediately ceases. The ill-effects of this are shown firstly by the dark red colour of the blood, and secondly by the darker colour of the flesh, particularly in cattle and pigs, and the rather more moist condition of the flesh. The presence of this moisture or serum, together with the de-oxygenation of the flesh, materially prejudices the keeping quality of the flesh and predisposes to earlier decomposition. This fact is of less importance in the case of meat to be used in a fresh condition in cold weather, but it assumes greater importance in summer time, and greater yet in connection with the carcases of swine intended for bacon.

The evidence of incomplete bleeding in shot animals, pigs especially, is best seen in the veins in the connective tissues, and also in the intercostal veins. I have recently seen carcases of pigs killed this way that were intended to show how perfectly they were bled, and yet blood could be pressed along practically all the intercostal veins in streaks 2 or 3 inches long. This was in marked contrast to the condition in pigs hoisted and stuck without being shot. The microscopic examination of sections of muscle to determine the completeness of bleeding, as recently reported, is an absolute waste of time and energy.

The ideals to be aimed at, then, in any method of procedure are:—(1) It must be quick in order to reduce to the lowest point any possible pain or suffering; (2) it must permit as complete bleeding as possible; (3) it must avoid as far as possible any mutilation of the carcase, such as will interfere with its appearance, rendering it in any way repulsive and unmarketable; (4) it must be as free from danger as possible to any other persons in the vicinity as well as to the operator; (5) any mechanically-operated instrument must be simple and as free as possible from complex construction, so that it can be cleansed readily and kept in working order, and so be continuously effective when used for a number of animals in more or less rapid succession.

These various points are all so essential that they must be considered in combination in estimating the relative values of different methods.

The slaughtering of cattle for food.—The general custom with regard to these animals is first to stun them, and then to stick them in the neck, cutting the skin and large vessels, thus allowing free and rapid bleeding, so that consciousness is not regained. As outlined earlier, the stunning may be carried out by the poll-axe, bolt, or the mechanically-operated captive bolt or bullet. The *captive bolt pistol at present available is often ineffective*, but I am informed that a new and more powerful instrument is almost perfected. That is the best piece of news I can give to the meeting, and I shall whole-heartedly welcome it and recommend its use if it answers the requirements of effectiveness. It is free from danger to third parties and reduces mutilation to a minimum. I consider the *bullet firing implements unsafe in an abattoir*, though the danger is less in a small slaughterhouse, where only one beast is being killed. The poll-axe is excellent *in the hands of a good man*, and at the present is probably the best implement available. After stunning by any of these means it is customary to introduce a "pithing cane," which is passed through the brain and medulla into the spinal cord. This destroys the brain centre controlling respiration and many motor centres, and renders it safer and easier for the slaughtermen. In my view the procedure is wrong, because, by stopping respiration and by exerting some inhibitory effect on the heart, a very important pumping action is lost, and bleeding is neither so rapid nor so complete. The stunning and rapid bleeding alone is better.

The Jewish method.—In this process of slaughter stunning is not permitted. The animal is first cast on the floor and securely trussed, the head is then fully extended, and the neck, with all its structures, is cut through to the spinal column by means of a long sharp knife. All the large vessels (carotids and jugulars) are therefore severed, and very rapid bleeding occurs, and is soon followed by loss of consciousness. The trachea is severed at the same time as the vessels, and quantities of blood enter and are churned up by the respiratory movements into a froth, and as this goes on for some time, a very revolting spectacle is produced. It is doubtful, however, if the suffering of the beast is anything like so great as at first sight it would appear to be, as there is complete loss of consciousness from anæmia of the brain long before the respiratory and cardiac movements cease. I have far greater objection to the method of handling of the beast in the course of its preparation for the incision.

The slaughter of calves often leaves much to be desired; they are sometimes stunned by a blow on the head before sticking, while sometimes they are "pithed" at the poll by means of a knife inserted into the spinal cord between the occiput and atlas, that is more forward than the corresponding operation in horses. I have also seen them slung up by the hind legs and then simultaneously stunned and pithed by means of a blow with an axe at the back of the poll. This posture facilitates bleeding and assists in producing the white veal so much sought after. In my view the best method is first to stun with the captive bolt pistol and then to sling by the hind legs and stick as quickly as possible. If the stunning is done at the back of the poll, there is practically no damage to the brain.

In slaughtering sheep in this country stunning is not often resorted to. The sheep is generally placed on a "crutch" (a special type of bench), and with the head extended, the animal is stuck right through the neck. Many slaughtermen then pith the sheep very expeditiously by the withdrawal of the knife, or the neck is broken. The bleeding is very rapid, and loss of consciousness quickly produced. If a bullet-firing instrument is used, there is often considerable damage to the brain. There appears to be less damage if the captive bolt pistol is used at the back of the poll, and I see no sound reason against its use beyond the fact that bleeding is not quite so complete.

Pigs.—Some of the pigs slaughtered in this country are first stunned, either by a poll-axe or heavy hammer, or by a Greener or R.S.P.C.A. pistol. The present captive bolt pistol is effective for smaller pigs, but not for large sows and boars. A greater number of swine, however, are slaughtered without stunning. The old method was to put a running noose on the upper jaw and by means of a windlass raise the head until the fore feet were almost off the floor. With the neck thus stretched, the pig was stuck and released, sometimes to walk about for a few minutes bleeding slowly and staggering until he fell from loss of blood—certainly a very repulsive sight. The

better method, now more usually adopted, is to slip a chain loop on a hind leg above the hock when the pig is some distance from the windlass. He is then hoisted off his feet and quickly stuck before he has recovered from the surprise and fully realised what is happening. In this posture he bleeds extremely rapidly, and consciousness, as indicated by corneal reflex, is lost in from 20 to 40 seconds. By this method the most perfect bleeding is obtained, and the *rapidity precludes any possibility of suffering.*

When stunning is carried out there is usually considerable hæmorrhage into the head, which is much depreciated in market value, and in many cases the shock, especially if the bullet is used, causes the appearance of more or less numerous blood-spots on the peritoneal and pleural membranes and in the fat and sometimes in the musculature. Carcases so affected are called " splashed " or " shot " carcases, and in extreme cases are usually condemned by meat inspectors, owing to the repulsive appearance and unmarketable condition. Such carcases are very unsuited for making into bacon, as they are very likely to develop " taint." This does not apply to all cases, but the proportion is so high that it is not a practical proposition to make bacon in any quantity, as in bacon factories, from pigs slaughtered in that way.

It will thus be seen that the whole problem is a very complex one, and is not to be solved by making compulsory the use of any particular instrument at present devised.

More humane treatment can, however, be ensured if all slaughtermen had to be licensed after training on dummies, and after being examined as to their ability. The license should be revokable in cases of ineptitude, negligence, or wilful cruelty.

With regard to mechanical killers, I submit that for use in abattoirs there is not yet one that can be accepted as safe and effective, except the captive bolt pistol for small animals. The captive bolt principle is the most hopeful line on which development should take place for the larger animals, also as likely to combine safety with efficiency, and I welcome the news that work is being carried out in that direction.

[Various instruments mentioned were shown and described by Professor Wooldridge during the lecture]

Discussion.

Major F. T. G. Hobday, C.M.G., before opening the discussion, showed a film representing the method of slaughtering horses at Antwerp. In some cases the animals were tied to the wall, while in others the legs only were tied. In the first case the horse was tied by a head rope about 3ft. long to a ring in the wall, and a man plunged a long knife into its breast. The horse stood still for a moment, the blood pouring out in a continuous stream; then it started plunging about, and finally leaped into the air, turned completely over, and came down on its side. After a few spasmodic movements it was apparently dead. In the second case, one man tied the horse's legs while another held its head. The first man then stabbed the animal in the breast with a large knife. The blood poured out and the animal plunged and fell. The method was frightfully revolting to imagine and to watch.

Dealing with the paper, Major Hobday said he proposed to approach the subject with which it dealt from the humanitarian point of view. Everyone must agree that when the life of an animal had to be taken, it should be taken as humanely as possible. In the case of animals destined for food, however, the value of the flesh as food was also a primary consideration. The ideal method was one which would combine humanity and utility—instantaneous loss of consciousness, with no deterioration of the quality of the meat; and all concerned in the matter—veterinary inspectors, butchers and so on—should study the question and endeavour to arrive at such a solution.

It was difficult to reconcile the statement made recently by representatives of large firms, who said that the flesh of pigs was damaged when the animals were killed by stunning, with other statements, apparently equally authoritative, to the opposite effect. In that connection he would like to quote the opinion of Mr. Parker, the Chief Veterinary Inspector of Newcastle-on-Tyne, who, before becoming a veterinary inspector, had himself been a butcher. Mr. Parker, in a letter from which he had his permission to make quotations, wrote:—

> In this city there are over 100 separate slaughter-houses. The animals are not generally killed with instruments other than the butcher's knife and a felling hammer. So far as cattle killing is concerned, I firmly believe there is not a better instrument on the market than that produced by the R.S.P.C.A. for the purpose, and I am of opinion that, were public abattoirs established, there would be little difficulty in quickly bringing about the universal use of that instrument. At the present time, however, its use is the exception rather than the rule, and, further, I know of men who slaughter cattle day after day and almost invariably bring down in a perfect manner each animal at the first blow, by using the flat or blunt side of the head of the felling hammer, after which they use the spiked end of the instrument to complete penetration of skull to brain. In other words, some men are able to stun the animal by the first blow. When that happens the slaughtering (or actual killing) is perfect in the interests of the animal; but a man may get tired, or he may not be feeling well, or he may have been drinking just previously or the night previous. Furthermore, every man has to practise before he arrives at a stage when he can confidently bring an animal down at the first blow. How does he get the practice? Hitting wooden blocks beforehand is, in my view, not perfect. It may answer in some cases; in others it will not, and in every other case, when the slaughterer is commencing the business, the first few animals he slaughters are his practising ground. Indeed, the number of these may be many. Some men are adepts, others can never be, hence the large number of failures, *i.e.*, cases where an animal may have the head bruised, an eye knocked out, blood oozing from the nostrils, and the animal getting on to its feet again, and finally after a minute or two—men and boys yelling all the time—the poor animal is at last brought down. When this can occur with a comparatively young and small bullock or heifer, what may be expected with a huge polled bull with an enormous skull? Often in such a case the man has to be picked for the job, and even then three or four blows with the hammer are often necessary to bring him down. Not so with the R.S.P.C.A.

killer, carefully and properly manipulated. Because of its being mechanical, its effect can be the same on each animal successively, even although the operator is tired. With reasonable care it should almost always be a success.

Until public abattoirs are established, pigs will continue to be badly knocked about at the time of slaughter. They are difficult to handle, are not roped and brought to a ring and held there like cattle, and are commonly killed in any position. When the spiked hammer (poll-axe) is used, mistakes are common, as with cattle; with the use of a loaded mallet, less damage occurs and fewer mistakes are likely with animals up to a certain size. To cover all risks, these animals, except very small ones, should be secured prior to stunning by some mechanical means, and the felling in these animals should be with an instrument such as is used for cattle. Similar remarks apply to calves.

With sheep I think some unnecessary suffering occurs with almost every animal slaughtered, apart from the Jewish method. Pithing and breaking the neck directly after proper sticking and bleeding is, in my view, quite wrong and likely to prolong suffering. If they are not stunned and are, as is generally done, stuck and bled, then they should not be pithed, as it only prolongs consciousness; in fact, it appears to do the very opposite to the intentions of the slaughterer, causing immediate paralysis, but not unconsciousness, and tending to prolong consciousness to the last. Quick and perfect bleeding may be good, if perfectly, theoretically and practically applied; but, knowing what human nature is, I would unhesitatingly compel every slaughterer to use prescribed means of first stunning the animal, to be followed by proper bleeding. No other means would ever satisfy me.

I do not think it will ever be possible to get butchers to agree to use shooting implements in the case of sheep. With cattle and large pigs I think it should become the law of the land to compel the use of a proper appliance such as the R.S.P.C.A. killer. With small pigs, small calves and sheep, an instrument for the purpose of quickly and effectively stunning should always be used. To bring about unconsciousness instantaneously at the commencement of every method of killing used is a line of argument even the traders cannot oppose.

Many experiments have been carried out for the purpose of proving whether the keeping qualities of meat were affected to any extent when using shooting instruments as compared with the pole-axe, etc. Many of the statements are—to say the least—absurd. The use of humane killers on cattle does not in the least affect the market value of the carcase.

The opinion of Mr. G. E. Body, the Meat and Food Inspector of Torquay, might also be quoted:—

As regards the keeping qualities of the meat of animals killed by me with humane slaughtering appliances, I have found it impossible to detect the slightest difference in the appearance, setting or keeping qualities of the meat of these animals from those killed in the ordinary way. Neither have I received complaints respecting the condition of the carcase or organs (although about 130 animals have been killed in this way), except for the small amount of hæmorrhage round the brain.

It seems strange, in view of the hundreds of thousands of animals which have been killed by shooting (the Greener killer to my knowledge has been in use for over 20 years, and many butchers I have met in my official capacity as meat inspector have killed all their large animals with a shot gun, a marble or piece of lead taking the place of the ball cartridge), that I have never heard them say that such a mode of killing had any detrimental effects on the meat. Neither, during my experience as a meat inspector, can I recollect being called to examine meat that had "gone wrong" owing to the animal having been shot.

It seemed, therefore, that experts were inclined to disagree. For killing a horse, he thought the humane killer or the poll-axe in the hands of an expert were the best methods. Merely to bleed them was a method which could not be said to be free from initial pain. With regard to dogs, the owners usually insisted on some method which did not involve the shedding of blood, and he favoured morphia and chloroform for that purpose. Electrocution was good, but needed special appliances and was not altogether free from danger. The quick injection of prussic acid into the chest was a speedy method, but could not be used in front of the owner on account of the contortions which followed. On the whole, morphia and chloroform was the best method, and many practitioners now destroyed scores of animals in that way, even in the presence of their owners. The injection of chloroform into the nostrils was a method he could not recommend, because if the dog did not get a sufficient dose he would bang his head on the floor and cause a most painful spectacle.

The humane killing of animals was very largely a veterinary question, and one the profession should take up. A good deal could be done if all slaughtermen had to be licensed by the Government, and were first of all tested for their efficiency for the work. It might be well for the Central to forward a resolution on those lines to the National, with a request that they should consider sending it to the Ministry of Agriculture, County Councils and other public bodies. They might add that children under a certain age should not be allowed to witness the killing processes. Major Hobday also exhibited several photographs, illustrating the methods of mass-destruction of animals in the United States, and described the process employed.

Lieut.-Colonel DUNLOP YOUNG said that there were so many opinions on the subject of humane killing that a state of chaos might be said to prevail. No one in Great Britain, probably, had had greater experience in the matter than himself, but his mind was still absolutely open; he did not take the side of the butcher, the Humanitarian Societies, or anyone else. The only conclusion he had reached, as the result of thirty years' work, was that the subject should be studied from the time the animal was killed until the meat was put on the table, by a special Commission, carefully constituted.

He held no brief for the butchers, but he had always tried to be fair to them, and it was only right to say that in thirty years he had never once seen a case of intentional cruelty. Accidents would happen, however. At Deptford, 1,300 cattle and 3,000 sheep were slaughtered every day, and the mechanical instruments the lecturer had exhibited would be useless; they could not be used without danger to the operator. Sometimes one bullock had to be tied to another before they could be got into the slaughterhouse.

The question of bleeding was a scientific one, and he thought the members, as scientific men, would agree that if one disturbed or destroyed the medullary centres, bleeding would be interfered with. He would like to quote the opinion of Mr.

Openshaw, one of the greatest surgeons in London, on that point :—

> The velocity of the escape of blood has a considerable influence on the change of arterial tension produced by bleeding. Sudden anæmia of the medullary centres excites, while slowly advancing anæmia, without any preliminary stage of excitation, paralyses the arteries. After rapid hæmorrhage, therefore, the heart is accelerated, the action of the respiratory pump increases, and the arteries are constricted. This increased rapidity in the heart's action drives more blood out through the divided vessels. The increased rapidity of the breathing drives the blood the faster through the lungs, and so into the heart and out at the cut, and the narrowing of all the small blood vessels also forces the blood back along the aorta, and so out at the divided vessels. This is all a matter of a few moments. It is the sudden failure in the cerebral circulation which stimulates the medullary centres and causes this general vaso-motor constriction (narrowing of the blood vessels), and hence the bleeding is more perfect. Moreover, as the result of the fall in the general blood pressure, clear serous fluid exudes from the tissues surrounding the blood vessels into these vessels, and thus every drop of blood is washed out of them. If perfect bleeding, therefore, is the object, the Jewish method of slaughter is, without the faintest shadow of a doubt, the only one to be chosen. By no other method can all the blood be removed from the body.

If that was the case, there could be no doubt that the Jewish method of slaughter, and the method of hanging the pig up and cutting its throat, must be the best for bleeding, although to anyone who saw it and was not familiar with the scientific side of the question it must appear somewhat revolting. Scientists acting on behalf of the Jewish Society had proved conclusively, however, that only three seconds elapsed between the cutting of the skin and vessels and loss of consciousness, and no other method was much quicker than that. The system used in North and South America was one which produced meat of very superior quality, because it was a combination of the two methods. The animal was knocked down, not with a poll-axe, but a round-headed hammer, and was therefore stunned without the brain being destroyed, and immediately bled, with the result that the respiration was kept going.

He agreed with Major Hobday, it might be useful to forward a resolution on the subject to the National. He thought, however, the resolution should state that there was such diversity of opinion on the question that it ought to be referred to a Commission representing all the bodies interested—bacon curers, butchers, scientific men and humanitarians.

Major-General Sir Layton Blenkinsop said no one had a greater feeling for animal suffering than he had. He had had to destroy large numbers of animals himself, and each time he had to do so he disliked it more. The question of the destruction of animals for food had to be approached from the scientific standpoint, due regard being paid to the effect on the meat. If the operation was carried out properly the pain caused was very momentary, but some methods were better than others, and it was necessary to decide which method was the best. This could only be done by scientific enquiry.

He had destroyed large numbers of horses on active service, but had never seen an accident with the Greener killer, or even when a revolver was used. During the South African war he had destroyed large numbers of horses on the decks of an iron ship—animals which had been injured owing to the fittings on the horse decks giving way in a bad storm. These horses were lying about in every position, sometimes five or six being piled on top of one another. They were all killed with a revolver, without accident. If the animal's neck was not kept straight or if it was not shot in the proper way, an accident might occur.

He would like to support Colonel Young's proposal that a resolution suggesting a scientific enquiry should be sent to the National.

Captain Fairholme said that on behalf of his Society he warmly supported Colonel Dunlop Young's suggestion that the question should be studied by a Commission. The question was a very controversial one, and one on which experts were apt to differ. Opinion amongst butchers differed also. A large number of butchers used the R.S.P.C.A. killer, and the Society had supplied over 200,000 cartridges during the past year. He could hardly imagine that so large a use would have been made of that instrument if its employment detrimentally affected the meat. He hoped the suggested resolution would be passed, because it would have a very great effect, even on the Treasury—which would have to pay for the Commission—and would, if adopted, save the Society a great deal of work and—more than all—it would save the animals a great deal of suffering.

Mr. Payne (Secretary of the Federation of Meat Traders' Associations) said that, speaking on behalf of 350 Associations of Master Butchers throughout England and Wales, all the members of his Federation asked for was that they should be provided with a mechanical slaughtering implement as safe and as efficient as the poll-axe—one which would not endanger the lives and limbs of the operators, or detrimentally affect the meat. Customers had objected to being served with meat in which there had been bullets.

Colonel Mosley said that the prevention of cruelty could never be assured until the Government took a bold line and first of all abolished private slaughter-houses. The continental plan of having public abattoirs should be adopted, so that veterinary inspectors could supervise the slaughtering. He agreed with the essayist that the presence of cruelty could only be judged by a veterinary surgeon versed in anatomy, physiology, and psychology. Municipal supervision was not enough ; there should be Government control and public abattoirs with veterinary inspection.

Major Dunkin heartily supported the idea of forwarding a resolution on the lines suggested to the National. He did not quite understand what the lecturer meant when he said he had known butchers stick a sheep by severing the vessels by the forward thrust and the spinal cord with the backward one.

Mr. J. Willett disagreed with what Professor Hobday had said as to the injection of chloroform down the nostril. He had used that method exclusively with dogs for many years, as it had proved painless and efficacious. If morphia were first injected, the operation took a considerable time. The lecturer had seen him destroy dogs in that way, and knew that the method was a successful one. It could not be applied, however, to cats. He always used an injection of chloral with cats ; just a prick with the needle and the cat gradually went to sleep. When under chloral, a cat was apt to lick its mouth and put its tongue out and withdrawing quickly. He did not know whether any other practitioner had observed this condition.

Captain Dunlop Martin agreed with Major Hobday as to the best method of destroying dogs. In his opinion, there was no nicer-looking or kinder way of destroying a dog than by morphia and chloroform. He agreed that that method required a certain amount of time, but as a humane man he thought the small amount of time required should be a minor consideration. The public looked to veterinary surgeons for a lead in the matter of humanity to animals, and particularly in the putting to sleep in the nicest possible way of old favourites and "old pals."

Mr. McINTOSH said he was heartily in favour of any method which would reduce the suffering of animals, and would support any action directed to that end.

Colonel WILLIAMS said his experience had been similar to that of General Blenkinsop, in that he had had to destroy a large number of horses, and that each time he did it he disliked it more. It had to be done at various times, however, when there was no cattle killer available. Speaking from the point of view of the Service, he considered it most important to demonstrate to all N.C.O.'s and men of the R.A.V.C., and in fact to all officers in the Service, the correct way of destroying an animal. On more than one occasion he had seen people who had not been taught the correct way to destroy a horse, make rather a mess of it, and one such experience was quite sufficient; one could never forget it. When a cattle-killer—which, he thought was a perfect instrument for the purpose—was not available, a revolver was the best thing to use. There was no need to handle the revolver as if one was a deadly shot; the horse should be held by the head collar, and the revolver held in the position in which the cattle killer barrel was fixed—aiming at a point about 1in. below the base of the forelock. There was no danger in holding the head collar, as when one pulled the trigger the horse fell directly in front of one, and death was instantaneous. He had never seen an accident with a revolver, but he did not recommend the method of shooting from ear to ear, as in that case the bullet might go through. With regard to animals killed for food purposes, the general concensus of opinion appeared to be that stunning followed by perfect bleeding was the best method. The way to settle that point was to hold a scientific enquiry, such as had been suggested. After seeing the film which Major Hobday had shown that evening, he sincerely hoped that whatever method of destruction was finally adopted, stunning would come first.

Mr. T. C. GARRY said that the question of the destruction of small animals, such as dogs and cats was an important matter for a city practitioner, who had a great deal of such work to do. Cats presented a good deal of difficulty; it was not easy to use a hypodermic syringe on them. He had always avoided destroying an animal before its owner when possible, because an owner often suspected cruelty when in reality there was none. He did not see the point of giving a cat morphia before chloroform, and thought it better to give the chloroform straight away. Injecting hydrocyanic acid into the chest cavity of a dog was a very quick method.

The PRESIDENT said he remembered years ago seeing an extremely effective method of killing an animal, although in the case in question it was done accidentally. A professor in Edinburgh had a donkey which he was using for preparing a special kind of tuberculin. He killed the bacilli and made a broth, but when he injected this into the jugular, the animal immediately dropped dead. The cause was stated to be embolism. It occurred to him then that embolism in the heart would be a very effective method of killing an animal. He tried injecting air into the jugular on one occasion with very bad results. Some time afterwards an owner, who did not want his hunter shot, asked him if it was possible to poison it. Instead of doing so, he tried the method he had described again, and on that occasion it was extremely successful. He would like to hear the lecturer's view on the matter. He did not believe such a method would always be effective, but when it was so it worked extremely well. He was glad the lecturer had put in a bad word for the lethal chamber, which, particularly when coal gas was used, he regarded as an abomination. He did not believe a dog, and especially a cat, when subjected to the fumes of coal gas, died a painless death. The morphia and chloroform method Major Hobday had mentioned was a very pleasant way of producing euthanasia, and was not only good for the animal, but pleased the owner. Morphia, however, should not be used with cats, as in some cases it acted as a delirient; chloral was an excellent way of destroying a cat, and if a very fine needle was used, the animal would suffer no pain. He had observed the licking Mr. Willett mentioned; it was very curious, but he did not think every cat did it. He had used hyoscine successfully with cats, and also chloral, introduced by an enema. Many years ago he had tried chloroform, introduced into the nostrils, but he did not agree with Mr. Willett that that method was always successful. In some cases the chloroform irritated the mucous membrane more quickly than it produced a soporific effect, producing violent spasms as the animal attempted to sneeze. He congratulated the lecturer on producing a scientific paper which avoided approaching the subject from a purely humanitarian or commercial point of view. He hoped some such resolution as had been suggested would be carried and forwarded to the National.

THE REPLY.

Professor WOOLDRIDGE, in reply, said few of the speakers had referred to the revolting exhibition which had been shown on the screen. Rather than that horses destined for food should be sent abroad to be slaughtered in such a way, it would be better to continue the present system of insisting on slaughter in this country, with inspection at the ports to prevent animals which were obviously being sent over for slaughter being exported alive.

He could not agree with Mr. Parker's statement as to pithing tending to prolong consciousness; he thought it retarded bleeding, but not loss of consciousness. It had also been said that shooting did not affect the meat, but he had had ocular proof recently which did not permit him to accept that under certain conditions. In cases where the meat had to be preserved in any way, particularly as in bacon curing, there was a distinct depreciation. The condition known as "taint" in bacon was largely contributed to by the shooting of pigs and consequent imperfect bleeding. Many of those engaged in bacon production, sound business men with progressive ideas, gave the shooting of pigs a long trial, but had found that a considerable proportion of the bacon so produced was not even second quality, and was unfit for consumption. They had, therefore, either to stop that method of slaughter or give up bacon curing. The men to whom he referred were in a very large way of business, slaughtering many hundreds of pigs each week. He did not think, however, that shooting affected to any appreciable extent the fitness of meat which did not have to be preserved, though it occasionally rendered portions unmarketable; the chief ill-effect it had was on the keeping qualities of the meat. In winter that did not matter much, though in summer the effect was, perhaps, more important. He thought that, with the exception of pigs, the best method of slaughter was by means of a captive bolt; stunning should take place first. General Blenkinsop and Colonel Williams had not seen any accidents when a free bullet or revolver was used, but personally he had seen bullets from the Greener killer go right through the animal and strike the wall, passing close to people who were standing round. He had seen men who had been struck by such bullets; luckily the effect in those cases had not been serious, but it might easily have been if an eye, for example, had been hit.

Since Mr. Willett showed him the method of injecting chloroform through the nostril with small

animals, he had used it on several occasions. When the dog to be destroyed was in a weak or moribund condition, as was often the case, there was no danger of failure, but with a dog in full vigour there was a certain risk, which was reduced if the choloroform was injected into one nostril, and not both. Once anæsthesia was produced, larger quantities could be injected down one or both nostrils. He preferred, however, using morphia before chloroform in other cases where the owner objected to the dog being mutilated. He did not think the chloroform and morphia process was as quick as injecting hydrocyanic acid into the chest, but the latter method could not be employed in the presence of an owner, as there was always an involuntary spasm of the larynx, which produced a sort of a shriek. He did not think, however, there was any real pain. The quickest method of all, but which involved mutilation, was the captive bolt, which was instantaneous. He did not recommend the use of morphia with cats, and in a few cases it produced a bad effect with dogs, but that did not occur often.

Colonel Mosley was very much to the point in suggesting the abolition of private slaughterhouses; there was no doubt that would help to prevent cruelty. Where inspection was constant, as would be the case in public slaughterhouses, there was a tendency to reduce cruelty in the manipulation of animals prior to slaughter.

Major Dunkin did not misunderstand him when he said he had known butchers stick a sheep by severing the vessels by the forward thrust and the spinal column with the backward one. The men were very expert, and it was wonderful what they could do.

Colonel Williams had referred to the sudden drop when horses were shot with a revolver. The same thing took place with a Greener killer, and where the animals could be easily handled, such methods were very effective. There was danger, however, with an animal which was difficult to control.

The President's account of the donkey that died, following an injection of a preparation of tubercle bacillus, was very interesting, but he thought his interpretation of the cause of death was probably incorrect; it was quite as likely due to anaphylaxis. The President had also referred to destroying horses by poisoning. That was not often done, but a veterinary surgeon had recently informed him he had killed quite a number with prussic acid. The minimum dose which could be used with safety was six ounces of Scheele's prussic acid injected per rectum: The gentleman in question had tried four ounces, but failed to kill the animal.

In conclusion, he thought it very desirable that a resolution calling for enquiry by a Commission should be passed by the meeting, but thought it might be left to the Council of the National to decide to what bodies it should be sent.

After some discussion, the following resolution, which was proposed by Major HOBDAY and seconded by Major-General Sir LAYTON BLENKINSOP, was carried unanimously:—

"The Central Branch of the National Veterinary Medical Association recommends the following resolution for the consideration of the N.V.M.A.:—

"As there is a great diversity of opinion on the question of the humane slaughtering of animals intended for human food and the subsequent effect on the flesh by the various methods used, we ask that a Government Committee of Enquiry, consisting of all professions and trades interested, be instituted to investigate the whole subject.

"If desirable, the N.V.M.A. are asked to consider the sending of the resolution to the Ministry of Health, the Ministry of Agriculture, the County Councils, and other public bodies concerned in the subject."

Foot-and-Mouth Disease.

The Responsibilities of Veterinary Inspectors and Practitioners.

BY SIR S. STOCKMAN.

The extensive invasion by Foot-and-Mouth Disease of many parts of England and Scotland and the necessity for an exceptionally large staff of Inspectors has resulted in the Local Authorities undertaking a considerable amount of work which in less strenuous times is carried out by Inspectors of the Ministry of Agriculture. Many veterinary inspectors of Local Authorities have rendered great assistance to the Ministry in examining animals which have been traced by the Ministry, notified and detained under suspicion on account of presumed exposure to infection, particularly at the numerous markets through which diseased animals passed during the last week in January. Numerous outbreaks of Foot-and-Mouth Disease have been promptly reported by veterinary inspectors of Local Authorities as a result of these inspections, and others have been reported by practitioners who had been consulted by clients in connection with the occurrence of disease among their stock. Whilst acknowledging the valuable assistance thus rendered by many veterinary surgeons, it is desired to urge upon practitioners the necessity for taking every precaution against the risk of carrying infection to premises visited after leaving the scene of an outbreak. A great deal of anxiety has been caused by the occurrence of outbreaks of the disease on premises where the history of the cases clearly indicates that infection had been carried by veterinary practitioners and Local Authority veterinary inspectors visiting in the course of their private practice subsequent to examinations of suspected and even infected animals. In view of the very infectious character of the disease, which can be disseminated indirectly by way of soiled clothing, boots, etc., it is imperative that practitioners, whether veterinary inspectors or not, should carry out a thorough personal disinfection in every case in which there is reason to believe *or even suspect* that Foot-and-Mouth Disease exists.

It may be useful to illustrate by means of one typical case, without multiplying descriptions of unfortunate incidents. Mr. ———, V.I. to L.A.,

was notified that certain cattle had been moved to a farm in his district (a clean one) from a market soon afterwards found to have been infected, and he was requested to visit and examine. This he did, but finding the animals healthy in appearance, he went on his private rounds and was instrumental in carrying infection to at least two farms, creating fresh centres, and involving the country in the expenditure of several thousand pounds. The animals he first visited showed visible clinical symptoms a short time after his visit. They were, in fact, in the late stage of incubation, and therefore highly infective at the time he examined them. The history of the anmials should have made him suspiciously cautious, and use of the practitioner's friend, the thermometer, might have confirmed such suspicion.

It should not be too much to ask veterinary inspectors, who are often also practitioners, to wear on special jobs of this kind rubber shoes and boots and overall clothing, which are easily disinfectable, and to apply disinfectants freely to their hands and such clothing before leaving suspected premises, no matter how slight the suspicion may be.

The case of the practitioner who is not an inspector is rather more difficult, for quite unexpectedly he may drop on a suspicious case in his practice while wearing ordinary clothing. It should not be difficult, however, for him to disinfect thoroughly his hands and boots, and to divest himself of a suspected garment or don a waterproof or other garment beyond suspicion until he can effect a suitable disinfection of his contaminated clothing.

It seems only fair from another point of view to warn members of the profession in a friendly way that the incidents referred to have been sufficiently frequent to set farmers enquiring what are the liabilities of a veterinary practitioner under the circumstances. For the information of the profession I have obtained reliable legal advice, as follows:—

If a practitioner visits such a case, and without taking all reasonable precautions to disinfect himself thereafter is the means of infecting the stock of another client, he risks proceedings being taken against him by the man who has suffered damage. The damage suffered, moreover, may amount to thousands.

First Proceeding for Annual Fee under the Veterinary Surgeons Act Amendment Act, 1920.

On the 21st February, 1922, at Croydon County Court, before Mr. Registrar Fox, the Royal College of Veterinary Surgeons sued Mr. James Carpenter, M.R.C.V.S., of 38a South End, Croydon, to recover one guinea, his annual fee or subscription as a member of the Royal College, due 1st April last, under the provisions of Section 2 of the Veterinary Surgeons Act (1881) Amendment Act, 1920.

Mr. Raymond Thatcher appeared for the plaintiffs, and the defendant did not appear.

Mr. Thatcher put in the Secretary's certificate that the fee was due and unpaid, and judgment was given for the plaintiffs.

The Veterinary Record.

4th March, 1922.

A SERIOUS INDICTMENT.

During the course of the present outbreak of Foot-and-Mouth Disease, the serious extent of which surpassed that of any visitation of the disease in recent years, and which appeared at one time to be a grave menace to the future of the stock-raising industry of the country, the veterinary surgeon had yet another opportunity of demonstrating his versatility and of proving once again his economic value to the State.

The response of veterinary surgeons to the appeal for assistance made by the Ministry of Agriculture during the darkest period of the outbreak is a tribute both to the *esprit de corps* of the profession and to the sagacity of the Ministry.

The enormous value of the work which was so ungrudgingly carried out by general practitioners, veterinary inspectors of the Ministry, and of Local Authorities is at least worthy of grateful acknowledgment.

It is a matter of considerable regret that such a splendid endeavour should be marred in however slight a degree by such unfortunate incidents as those detailed by Sir Stewart Stockman, and which we publish elsewhere.

The sympathetic understanding of all knowledgable persons would have been unhesitatingly extended to a practitioner or inspector who in the ordinary course of his work had been called upon to examine animals of which he had no reason to suspect any recent exposure to infection.

Unfortunately the particulars furnished by Sir Stewart Stockman do not permit of any question regarding their accuracy. It seems to be almost incredible that any member of the profession can so far have been neglectful of his duty as to fail to adopt the necessary precautions to preclude any possibility of carrying infection from animals which were known to have been recently exposed to infection.

We agree with Sir Stewart that "the history of the animals should have made him suspiciously cautious, and use of the practitioner's friend, the thermometer, might have confirmed such suspicion."

The legal advice which has been obtained by Sir Stewart Stockman serves as a warning of the penalty of carelessness, but we submit that there should be no justification for the necessity of such a warning.

Clinical and Case Reports.

The Editor will be glad to receive from members and others contributions to this column of reports of interesting cases.

On a Valve-like Arrangement sometimes met with in Disease of the Uterine Cervix of Cows.

By F. T. Harvey, F.R.C.V.S., St. Columb.

In the *Veterinary Record* recently (Jan. 14th) there appeared an interesting paper by Captain Maguire on "Diseases of the Reproductive Organs and of the New Born," wherein mention is made of a swollen condition of the mucous membrane of the uterine cervix of cows forming a sort of valve. I do not remember having previously seen any description or allusion to the condition indicated in the heading to this note. I have often found it present in uterine sepsis in the cow, and it is curious that it should have received so little attention from clinicians. There is no doubt that the explanation of the phenomen given by Captain Maguire is correct, viz., that it is due to a swollen or inflammatory condition of the circular folds of the mucous membrane of the part. There is another factor, however, which is important in determining this valve-like formation, and that is contraction of the circular muscle fibres around the os or posterior uterine segment. In the cow the circular folds of mucous membrane of the cervix are four or five in number, the anterior and posterior ones being usually the best developed. To feel them properly one must examine a case of retained after-birth when the os is well open. It would be interesting to know whether Captain Maguire has met with any description in veterinary literature dealing with the condition.

The uterine cervix of the cow is an exceedingly troublesome organ for the practitioner. One may usually explore the womb of a mare for some time after foaling, but the bovine uterus may quite early become a closed territory, and this irrespective of the existence of sepsis. Here you may introduce fluids into the womb, but you may not get them out again, and then harm often results, while in another set of cases you may neither get in fluids nor anything else—pessaries, or a sound, for instance. In some cases a finger may be passed through the os and commencing ridge formation felt beyond, and later the mucous membrane may project sufficiently to form an actual valve, so preventing or hindering outward flow.

As mentioned above, the condition seems to be determined by two factors, one is the rapid return of the tissues of the cervix to the rigid or firm condition, the other an infection or injury of the mucous membrane covering the area. The unyielding cervix in time induces a sort of prolapse of the swollen mucous membrane, and this latter may pass either into the womb or into the vagina, or both, and when this happens it is difficult to find a passage either from or to the uterine cavity.

In a recent case of metritis in a cow following a retained after-birth there was an intermittent discharge from the womb, a continued high temperature, severe lameness due to synovitis and sesamoiditis, wasting, and finally death. The passage through the cervix was so tortuous that it was impossible to wash out the cavity, or carry out any sort of local treatment in a satisfactory manner. When this lock occurs at the cervix (and the condition is by no means uncommon), treatment is rendered the more difficult, and a discussion on the subject in the pages of the *Record* would be of value.

The bovine uterus presents more problems to the practitioner than that of all the other domesticated females. Types of retention of the after-birth in the cow can scarcely be said to exist. In a hundred cases hardly half-a-dozen will be found to be alike, or not presenting some special feature; and yet as regards the treatment of the condition practitioners seem to be divided into two camps—"removers" and "non-removers." As is usual the truth lies between the two extremes. Nearly all the morbidity of retained after-birth in the cow seems associated with premature or early contraction of the os, and the blocking of the channel, this preventing efficient drainage of the uterine cavity. If I were given twenty cases each of retention of the after-birth in mares and cows to treat from the early stage (apart from obstructed delivery or of surgical interference), I should expect all the mares to be well on the third or fourth day, that they would have suffered practically no loss of weight or other disability, but that with the cows at the end of a week there would be a certain amount of wreckage. Nearly all would have lost weight, and there would be other signs of a fevered condition, and yet the cow is said not to be affected to the same extent as the mare in placental retention. The problem is interesting. The cow is quite as susceptible to sepsis as the mare in retained after-birth, but her response is different. With the mare it is volcanic, often sapræmic, but controllable; in the cow it is of slower development, less explosive, more enduring, and less easy to manage. In the former patient the os will be found open practically all the time; in the latter it will be after a few days almost uniformly closed. A case of retained after-birth in the mare is usually a pleasure to treat, in the cow it is often a disappointment and a sepsis, but not necessarily, and even rarely, a death. In addition to the points already alluded to, the downward bend of the extremity of the horn of the bovine uterus also adds to the difficulty of drainage. In the mare one can always either syphon off or mop up all fluids; with the cow it is often impossible to do either very satisfactorily.

"In pregnancy (woman), before uterine contractions begin to be painful, the circular fibres around the internal os are inhibited; the longitudinal fibres of the uterine body then pull the os open, and thus the cervix, instead of being a narrow canal leading to the uterine cavity, comes to form part of it." (Herman's *Difficult Labour*, p. 294.)

A similar statement of course holds good in the case of the cow, but with the latter inhibition of the

circular fibres of the posterior uterine segment tends to be brief, and frequently contraction occurs before the membranes are expelled, so that these latter and the lochia may be both indefinitely retained.

The illness sometimes seen in cows, apart from difficult labour, or retention, a week or two after calving, and regarded by many as associated with the non-discharge of the so-called second cleansings, may be related to this state of the os, and possibly also that condition which may be provisionally termed "Imrie's Disease." See *Veterinary Journal*, August, 1921, p. 290.

Anæsthetising a Monkey.

By Hamilton Kirk (Capt.), M.R.C.V.S., Wigmore Street, W. 1.

A tiny species of squirrel monkey was recently brought to me in order that I should amputate most of its tail. The owner complained that sores were constantly in evidence on various parts of the tail, which, on account of the monkey's wilful and persistent interference, never healed, in spite of all treatment.

The little animal could lie easily within the palm of my hand, and I was in some doubt as to the probable effect upon it of a general anæsthetic. I decided to administer A.C.E. mixture. The monkey was confined in a wooden cage, upon the perch of which it spent most of its time sleeping, with its head tucked down between its thighs and its tail wrapped round its body. It was never a lively animal, but resented interference by means of some remarkably sharp teeth; these were so small and so very close together that its bite inflicted a wound having the appearance of a clean incision.

To avoid unnecessary handling or restraint, I sought to administer the vapour whilst the monkey slept. Hobday's second pattern of inhaler was employed (minus the mask), and the sudden delivery tube passed through the bars of the cage into close proximity with the nostrils. The vapour having been pumped through for ten minutes, without anything happening, I touched the nose with the tube; the monkey thereupon looked up sleepily, gazed at the tube, pushed it away with its hand, and then went to sleep again. I continued pumping for another five minutes without result, then changed the A.C.E. mixture for chloroform. After its administration for five minutes, the animal began to grab the tube for support, and was obviously losing its balance. I found then that I could handle the little fellow without resistance, so removed him to the operating table, where he was laid upon a blanket and completely anæsthetised after three or four more minutes.

I assumed that the long time required to bring about unconsciousness was due to the large proportion of air inhaled, and not to any idiosyncrasy on the part of the monkey.

The operation was performed under strict asepsis, the excision being made through a joint, and the skin brought over the stump and sutured. The wound was painted with orthoform in collodion, and a bandage applied. Consciousness was regained almost at once, and the old attitude of sleep was shortly afterwards resumed as though nothing had happened.

For the next three days the monkey never turned a hair, and I was gratified to find that it never once attempted to interfere with the bandage; in fact, it did not seem to realise its tail had been removed. The absence of pain or inconvenience was undoubtedly due to the prolonged anæsthetic effect of the orthoform.

A Clinical Note on the Hyper-infectivity of Sarcoptes Scabiei var Equi.

By Prof. J. Russell Grieg, Edinburgh.

The fact that equine sarcoptic mange is capable of transmission to man and may give rise to an intense, if temporary, pruritis in the human subject has been recognised for many years, but a feature of interest in the following case lies in the extraordinary virulence and hyper-infectivity which the parasites manifested.

The subject was an aged van gelding in an emaciated condition, which was admitted to the College hospital suffering from an extensive attack of sarcoptic mange. Treatment was commenced and continued for three weeks, but at the end of that time it was considered that, in view of the animal's condition, destruction was the more economic course.

During treatment one of the grooms complained of an irritable rash extending over the shoulder and arm, and the writer himself suffered from a similar eruption on the right fore-arm. The symptoms were, however, trivial, and quickly disappeared after the application of parasiticide washes. Immediately after the animal's destruction the body was used by a number of students in the class of surgical anatomy. The students were engaged upon the body for a period of time which varied with the individual from two to five hours, and of those so engaged approximately 80 per cent. contracted sarcoptic mange. The symptoms and lesions in each case were identical, but there was considerable variation in the extent of the infections; the individual lesion commenced as a small and itching papule, which in many instances was seen to be associated with a sarcopt gallery. In one case a general infection took place accompanied with considerable constitutional disturbance, but apparently this subject possessed a hyper-susceptibility to scabies in that there was a previous history of his having contracted scabies in early childhood, when a severe general infection also resulted. In another case symptoms of intense itching were noted within about two hours of contact with the dead horse.

The horse in question had been carefully isolated, but six other horses in the hospital also became infected with localised scabies within a fortnight of the occurrence of the human infection. Dr. Stewart McDougall of this College has kindly examined the parasites from the horse and identified them as *Sarcoptes Scabiei var equi*, and Mr. R. A. S. Mac-

Donald, B.Sc., M.R.C.V.S., has furnished statistics and other details.

It appears to the writer that one of the most interesting features of the outbreak is the apparently high infective power of the parasites. In the large veterinary hospitals in France, with accommodation for between two and three thousand mange cases, the incidence of scabies among the army grooms and attendants was not unduly high. It is possible in this case that since the animal had only recently been destroyed when contact took place, the parasites were abnormally active as the result of the rapid decrease in the temperature of the carcase, but many such horses were destroyed in base hospitals during the war, and the "knacker-men" who came in contact with the hides were not unusually susceptible.

Our knowledge of parasitism is still far from complete, but it would seem that in certain cases of parasitic mange the infectivity and virulence of the parasites is enormously increased—a point which seems to have been insufficiently recognised. In support of this statement I quote the following extracts from "Neumann's Parasites and Parasitic Diseases of the Domestic Animals" (second edition), page 133 :—

"Barat reported to the Lyons veterinary school an instance of several persons having received mange from a horse. . . . Grognier relates that a mangy horse had communicated its disease to a number of people who had dressed it before it was sent to the Lyons veterinary school. Robert Fauvet, an Italian veterinary surgeon, states that a farmer having bought a mangy horse rode it home, and the day after his arrival he felt a great itching all over his body. The same was the case with a son and a friend who accompanied him on his journey. The groom to whom he entrusted the horse scratched himself very much the second day after he had been grooming the animal. These persons afterwards conveyed the disease to others on the farm, and more than thirty persons were successively attacked. The farmer sold the mangy horse to a miller who, with his sons who had touched the animal, were soon after suffering from the itch. . . . In 1856 several pupils of the Alford Veterinary School contracted the itch through operating upon a mangy horse. This was the occasion on which Delafond discovered that this form of scabies was due to a sarcopt which he considered was identical with that of man."

One has occasonally met with similar cases of scabies in which the infective powers of the acari appeared to be abnormally high, but none so striking as the above. The transmission of canine and feline scabies to man is not of infrequert occurrence, and in certain cases the infection appears to occur with great facility. Many of these cases may be due to a hyper-susceptibility on the part of the individual attacked, but in this outbreak the facility with which infection occurred can only be explained by assuming the parasites to possess an extraordinary high degree of virulence, since many persons and animals contracted the disease.

A clearer understanding of the circumstances which affect the virulence and the consequent infective powers of ecto-parasites might do much to solve many of the difficulties which we experience in the treatment of the important diseases of which they are the cause.

Notes and News.

Recognition for a Gallant Act.

Captain Hamilton Kirk, M.R.C.V.S., has recently through the war office, received the "Medaille de Sauvetage" in bronze, together with a certificate, from the Ministry of the French Republic, with the British official war office permission to accept and wear the medal on all occasions. This medal corresponds to the British Humane Society's medal for saving life, and was granted to Captain Kirk for gallantly plunging from one of the bridges in Paris into the Seine and rescuing a woman who was drowning. This occurred on September 25th, 1919, Captain Kirk being in uniform at the time and on his way home from Germany after demobilisation. Had he not seen her and acted as he did, there is no question but that the woman would have lost her life, and it was on the strong recommendation of the Paris Police Authorities that the award was made.

Exportation of Horses to the Continent.

The Ministry of Agriculture has decided to issue special permits in certain circumstances for shipment of race-horses, polo ponies, and hunters to the Continent without the usual veterinary examination ; but the concession is intended to apply only to exports from those British ports at which no facilities for official veterinary examination exist to ports on the Mediterranean Sea, or any ports in France or Spain south of and including Bordeaux. The British ports at which the necessary veterinary facilities exist, and to which, therefore, this concession will not apply, are Folkestone, Goole, Harwich, Hull, Leith, London (including Tilbury) and Southampton.

Applications for special permits must be made on the forms supplied for the purpose by the Ministry, and must reach the Ministry not later than a week before the proposed shipment.

It will be understood that the issue of these permits does not in any way affect the requirement that the shipping company shall comply with the existing regulations regarding the fitness of the vessel and the general conditions of transport, which include light, ventilation, sanitation, and, in cases of journeys exceeding 6 hours, the suitable feeding and watering of the animals.

Ministerial Foot-and-Mouth Information.

Mr. Turton asked the Minister of Agriculture whether he would grant a full enquiry into the circumstances connected with the outbreak of foot-and-mouth disease, with special regard to its origin ; whether the Ministry was satisfied that the present law and regulations were sufficient to meet a terrible outbreak of the present character ; and, if not, whether he would introduce legislation on the subject.

Sir A. BOSCAWEN: I propose to appoint a Departmental Committee to inquire into the origin and other circumstances connected with the present outbreak of foot-and-mouth disease. Pending the receipt of the report, I do not propose to consider any revision of the existing legislation relating to diseases of animals or of the regulations made thereunder.

Lt.-Col. W. GUINNESS asked how many cattle had been destroyed in connection with the present outbreak of foot-and-mouth disease, and whether he would make inquiries as to the efficiency of the methods of isolation without destruction adopted in connection with this disease in France.

Sir A. BOSCAWEN replied that the slaughter of 17,037 cattle had been authorised up to and including Sunday, the 19th inst. He was advised that the whole methods of isolation adopted in France had been quite ineffective as a policy for the eradication of the disease.

Lt.-Col. GUINNESS: Is there any limit to the size of the outbreak which the Minister considers suitable to be dealt with by this very costly method of destruction?

Sir A. BOSCAWEN: It all depends whether we consider the outbreak epidemic or not. In this case we do not, and we think we have the matter well in hand.

Captain DIXON asked whether the detention of Irish store cattle was causing great loss to farmers, and whether he would now withdraw the detention order.

Sir A. BOSCAWEN: Yes, Sir, I am aware that some loss is unfortunately being incurred by farmers in consequence of the detention of Irish store cattle, but the situation with regard to foot-and-mouth disease has not yet improved sufficiently to justify me in withdrawing the Order. (Hear, hear.)

Captain DIXON: Is it not the fact that there is no disease of any kind in Ireland? (Cries of "Oh.")

Sir A. BOSCAWEN: We have not been able to trace the actual existence of disease in Ireland, but, apart from that, the movement from market to market of Irish stores is, in our opinion, a very fruitful way of spreading disease, and we do not see our way to remove the Order at the present moment. (Cheers.)

The Ministry of Agriculture announces that during the past week-end the number of fresh premises on which foot-and-mouth disease appeared were 14, 13, and 16, on successive days, all of which were in areas already infected. Twenty-six of these cases occurred in Yorkshire. The position shows a steady improvement.

THE SHIRE SHOW.

The slight falling off in the number of the exhibits at the Shire Horse Show held at Islington during the last week was compensated for by their quality, which enables one to say that this exhibition ranks amongst the best that the Society has ever held. One great feature was the excellence of the classes of young stallions, which was certainly exceptional, and the judges had by no means an easy task.

The King and Queen, accompanied by Princess Mary and Viscount Lascelles, visited the Shire Horse Show on the Wednesday afternoon. After witnessing the awarding of the championships, the King entered the ring and presented the cups and medals to the successful exhibitors. The King's challenge cup for the best stallion was received by Miss Stanton on behalf of her mother, Mrs. Stanton, of Snelston Hall, Ashbourne, Derbyshire, the first woman to win either of the championships.

The fillies and mares were more uniform in type and merit than the male classes, the fillies, especially, comparing more than favourably with the colts of corresponding age. Sir A. Nicholson showed a particularly good yearling by Champion's Goalkeeper, and the other filly classes had worthy leaders in daughters of Pendley Leader and Childwick Champion respectively.

Mr. Williams' champion mare, Crossways Forest Maid, is a well-proportioned bay four-year-old by Friar Tuck IV., and Mr. Freckelton's reserve champion, Pendley Lady, a year older, was bred by Mr. J. G. Williams and sired by Champion's Goalkeeper. Two of the classes—12 and 13—were headed by what are probably the only daughters of the famous Lockinge Forest King now being exhibited, Sir B. Greenwell's mare being 12 years old and Mr. Carson's noted mare two years older and still fresh. The geldings showed to better advantage than usual.

THE LATE MR. J. AITKEN.

Mr. John Aitken, M.R.C.V.S., a well-known figure in East Fife agricultural circles, has passed away suddenly at his residence in Hunter Street, Kirkcaldy.

Only 39 years of age, Mr. Aitken, who was the eldest son of the late Mr. John Aitken, M.R.C.V.S., Edinburgh, carried out his duties as usual on Saturday, but shortly after his return home he was seized with an illness which ended fatally.

Owing to the outbreaks of foot-and-mouth disease among cattle, Mr. Aitken had been greatly overworked of late, and this is regarded as the cause of his seizure.

During his thirteen years in Kirkcaldy Mr. Aitken built up an extensive practice, and held several public appointments, including that of consulting veterinary surgeon to the Town Councils of Kirkcaldy, Burntisland, Buckhaven, and Dysart. He was also the Board of Agriculture's Officer for the county of Fife under the Swine Fever and Infectious Diseases Order.

Deceased is survived by a widow and three young children.

COAL MINES ACT.

In pursuance of Section 86 of the Coal Mines Act, 1911, and under the provisions of the Mining Industry Act, 1920, (*a*) the Board of Trade hereby make the following Regulations, and direct that they shall apply to all mines to which the Coal Mines Act, 1911, applies:—

1. The Third Schedule to the Coal Mines Act, 1911, shall be amended by the addition of the following paragraph:—

"No horse shall be taken into or out of any part of a mine upon a bogie or other carriage excepting in a case of necessity arising through accident, or through injury to or illness of the horse; provided that nothing in this Regulation shall apply to the lowering or raising of a horse either through a shaft or by way of an incline where a horse could not walk with safety owing to the gradient."

2. Sub-section (2) of Section 45 of the Coal Mines Act, 1911, shall be amended by the omission of the words "to get to its work."

3. These Regulations shall come into force on the 31st March, 1922, and may be cited as the Coal Mines General Regulations of the 10th February, 1922.

W. C. BRIDGEMAN, *Secretary for Mines.*

Royal College of Veterinary Surgeons.

MARRIAGE.

On February 22nd, at the Parish Church, Henley-on-Thames, by the Rev. Stanley Wade, C.F. (Oxford), George Stuttard, only son of the late Mr. Stuttard and of Mrs. Stuttard, Burnley, Lancashire, to Marjorie, eldest daughter of Mr. J. H. Carter and Mrs. Carter, Avalon, Henley-on-Thames.

OBITUARY.

AITKEN, J., 18 Hunter Street, Kirkcaldy. Graduated 19th December, 1904, Edinburgh. Aged 39.

BROWN, G. F., 566 High Road, Leytonstone. Graduated London, 20th December, 1887. Died 12th February, 1922. Aged 61.

DARLING, W. G., St. Peter's Street, Tiverton, Devon. Graduated Liverpool, 19th December, 1905. Died February 21st, 1922. Aged 40.

MALLOCH, R. M., Professor of Anatomy, Veterinary College, Glasgow. Graduated 21st April, 1886. Died 16th February, 1922. Aged 65.

ROBERTS, G. W., Corve Street, Ludlow. Graduated London, 14th January, 1885. Died 20th February, 1922. Aged 65.

Correspondence.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.
All correspondence must bear the name and address of the contributor for publication.
The Editor does not hold himself responsible for the opinions of his correspondents.

The Royal Counties Resolution.

Sir,—In your issues of January 21st and 28th last, you publish continuations of the report of a meeting of the Council N.V.M.A.

A resolution sent by the Royal Counties, and which I proposed, was dealt with.

I am compelled to send you these comments thereon as it appears to me most clearly that the true facts which gave birth to the resolution were overshadowed and almost lost sight of by the remarks of one member present, whose desire it appeared to me was to impress the Council that the object of the resolution was to stultify research work.

The passage to which I particularly wish to draw your attention is the following: "If you want new vaccines or sera tried—and they must be tried widely before being put into practice—it is impossible to do so without the direct co-operation of stockowners." This I readily admit to be correct in so far as experimental materials are concerned, and to these the resolution was not intended to apply, but to those already recognised and beyond the experimental or research stage.

Diplomacy—a word which can be expressed by another which does not sound so sweet—is not one of my gifts. I prefer to call a spade a spade.

If certain remarks and reports contained in the *British Friesian Journal*, in its issue for January, 1921, and with which the said resolution was concerned, be allowed to pass unchallenged, it would lead the public to infer, in my humble opinion, that the M.R.C.V.S. of to-day accepts the decision of those highly placed in our profession, who may suggest that he is incapable of carrying out and untrustworthy in conducting the tuberculin test, and, consequently, in giving his decision upon the results thereof.

I can see that in the near future, unless we hustle, the time will arrive when the position of the country practitioner—who by the way is often stated by certain persons, when it suits their purpose, to be so urgently needed by the country—will be much the same as that of the old "cowleech," and simply called upon to do the dirty work for the "kid-gloved and spatted gentleman" above him.

I observe in the current number of the *Veterinary Record* the continuation of a report of Special Meeting R.C.V.S. Council, and on page 96 it is reported that a member used these words, "I should like, however, to say that in the future 'two grades' of veterinary surgeons may be necessary: the practising veterinary surgeon, who may be satisfied and willing to carry on his life's duties under the conditions usually met with in general practice, especially country practice, and it may be that it will be necessary to produce another grade of veterinary surgeon to occupy the position of the veterinary inspector of health." Surely, at the present moment this statement will not be welcomed by the general practitioner, who has waited long and patiently for *some of the plums* to fill the gaps caused in the terribly depleted practices by the advent of motor traction. In human practice medical officers of health are *in by far the largest majority of instances also general practitioners*; and why, may I ask, should a distinction be considered necessary in our profession?

Let the preliminary education of our students be such that later they will uphold the dignity of their calling by being honourable, capable, trustworthy and self-respecting members of a noble profession. A *good education* tends to produce these results.

I trust that, at the ensuing election of candidates to the Council R.C.V.S., every M.R.C.V.S. will exercise his prerogative and record his vote. To the general practitioner I would like to issue this warning, that in my opinion unless we are very careful and observant we shall be robbed of our just rights and discover, when too late, that we are "on the rocks."

Yours faithfully,
J. CHARLES COLEMAN, M.R.C.V.S.,

Swindon, Wilts.,
February 13th, 1922.

Theory and Practice.

Sir,—The Students' Union feels that the "Word of Advice to the Theoretical Student," which appeared in the February issue of the *Veterinary Journal*, cannot be allowed to pass without comment. The fact that he is theoretical, that is, well founded in broad principles, is surely an argument in his favour.

The colleges have to provide a student with as much information as can be well retained to start him on a career, which may lead him to become a pathologist, hygienist, administrator, or practitioner. It is little wonder, then, that a recently qualified man does not know all the little ins and outs of practice as well as an old and experienced practitioner. The cry that the colleges do not turn out the "practical man" is as old as the Royal Veterinary College itself. And yet veterinary science has undisputably made progress since then.

Coming back to the advice: It is excellent, but alas, theoretical. The student is willing and eager to see practice, but the practitioners who are willing to take a pupil form a very small percentage of those on the register.

The students of the London college, left to fend for themselves (perhaps a good sign in these spoon-fed days), have formed a union, one of the objects of which is to get into touch with practitioners who are willing to take pupils, and introduce students who have no friends or relations in the profession so that they may have the opportunity of seeing *practice* from the inside. And in spite of criticism and indifference, the union is making headway in its object.

Nowadays unity is essential, in consideration of the facts that the veterinary profession is having much of its legitimate work taken up by men of other professions (whose blunders, however, are laid at the door of the veterinary profession), and that the Royal College of Veterinary Surgeons has envious eyes cast upon its right to grant the license to practice by some of the universities, who would have us in the same muddle as the medical profession, where some are partially qualified and others, though qualified, cannot recover a fee at law. In these days it would be well to pull together and let the student who intends to practice have the opportunity of seeing practice while still a student, so that, when qualified, he may not be held as a bad example of the existing system, which after all produces fewer failures than many other professions.

Yours faithfully,
E. HALL, *Hon. Sec.*

Whole-Time Salaries.

Sir,—Major Hobday, in his remarks on "Whole-Time Salaries," in your issue of December 10th, remarks: "It is to the posts abroad that the veterinary surgeon has to turn for adequate remuneration."

In case this should mislead a young graduate into swallowing the gilded pill, I attach a comparative table of the salaries accorded to officers of the Malayan Service for their serious consideration. They should be able to judge from it what their "status" is likely to be in the country, and their prospects they can plainly see are nil.

Exceptions I know prove the rule; I wonder how many other Colonies hold the invidious "adequate remuneration"

distinction of being the absolute last on the list ?—Yours truly, H. G. SIMPSON, F.R.C.V.S.

January 17th, 1922.

Department.	Present rate of Salary p.m. + Annual Increment p.m. $ $ $	Years of Service to reach max.	Higher Appointments per month.
Agriculture ...	400 to 800 +25	17	Director, $1,050 to $1,200; Heads, $100 allowance.
Education ...	400 to 800 +25	17	6 at $850.
Forest	400 to 800 +25	17	6 at $900.
Geological	500 to 800 +25	17	1.
Medical ...	440 to 800 +25	16	16 from $850 to $1,200.
Mines	400 to 800 +25		
Postal	400 to 800 +25	17	4 at $850; 1 at $1,050.
P.W.D. ...	400 to 800 +25	17	17 from $850 to $1,200.
Survey ...	400 to 800 +25	17	8 from $900 to $1,200.
Chief Sanitary Inspectors ...	400 to 800 +20	21	
Building Inspectors	400 to 800 +20	21	
Works Engineer	400 to 800 +20	21	
Registrar of Vehicles ...	400 to 700 +20	16	
Veterinary ...	350 to 650 +15	21	None.

The Shoeing Problem.

Dear Sir,—I have read with the greatest interest the paper by Sir Layton Blenkinsop, and also the discussion which followed it, on the Blenkinsop shoe. As one who has tried this shoe, may I express the hope that anyone, who has not tried it will do so; it will amply repay him.

There is one vital point that to us all is really paramount, and that is, that anything in these days that really enhances the efficiency of the horse cannot be neglected, and less than ever now, as there are indications all round of a revulsion in favour of the horse.

The well informed civilian—by this I mean the non-professional civilian—is so well versed by self education in scientific and allied subjects, that we simply cannot afford to lose ground anywhere, or much less to lose an opportunity of being in a position to express informed views on any public matter. And this is a public matter. May I illustrate this by saying that I was present the other day in a knot of people talking, where my identity was not known; one man, a non-professional, was expressing himself on the subject of distemper.

From the grasp and general knowledge of the subject he disclosed it might have been a set lecture on the subject, and I have no reason to suspect that he had specially prepared his subject, as the conversation was purely accidental, and this is no exceptional instance.

One feature that arose in the discussion on this shoe was as to whether steel was a suitable material. It may interest to record the manufacturers' view in the general manufacture of shoes that a mild (low carbon) basic (non-acid) steel is required for the manufacture of shoes, as basic steel will stand being re-heated three times—this for purposes of fitting, etc.—Yours faithfully, A. J. SIMPSON, Major R.A.V.C.

TIDWORTH,
10*th February*, 1922.

Diseases of Animals Acts, 1894 to 1914. Summary of Returns.

Period.	Rabies. Cases Confirmed. Dogs.	Rabies. Cases Confirmed. Other Animals.	Anthrax. Outbreaks confirmed.	Anthrax. Animals attacked.	Foot-and-Mouth Disease. Outbreaks confirmed.	Foot-and-Mouth Disease. Animals slaughtered as diseased or exposed to infection.	Glanders (including Farcy).* Outbreaks reported by the Local Authorities.	Glanders (including Farcy).* Animals attacked.	Parasitic Mange. Outbreaks reported by the Local Authorities.	Parasitic Mange. Animals attacked.	Sheep Scab. Outbreaks reported by the Local Authorities.	Swine Fever. Outbreaks confirmed.	Swine Fever. Swine slaughtered as diseased or exposed to infection
GT. BRITAIN.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Week ended 18th February, 1922	...	...	18	18	173	...	...	...	27	39	25	34	14
Corresponding Week in 1921	2	...	10	10	1	66	...	...	83	143	25	23	5
1920	...	...	9	9	2	220	1	5	154	270	21	40	20
1919	1	1	3	13	2	190	...	...	208	387	15	18	3
Total for 7 weeks, 1922 ...	...	...	78	83	770	29831	...	...	320	507	265	187	70
Corresponding period in 1921	13	1	102	123	23	2209	2	4	652	1058	232	172	40
1920	2	...	68	87	28	1640	6	13	1140	2119	177	304	114
1919	16	2	29	43	16	990	...	...	1230	2554	138	124	39

NOTE.—The figures for the current year are approximate only. *Excluding outbreaks in Army horses.

IRELAND.												
Week ended 18th February, 1922	...	...	...	...	...	...	...	...	Outbreaks 5	11	5	71
Corresponding Week in 1921 ...	...	...	...	2	...	...	4	8	2	15		
1920 ...	...	...	...	...	...	...	4	8	...	...		
1919 ...	...	...	...	...	...	...	2	4	1	25		
Total for 7 weeks, 1922	...	...	...	...	...	...	37	40	48	264		
Corresponding period in 1921 ...	...	...	2	41	...	...	18	72	8	58		
1920 ...	...	...	...	...	1	2	26	68	1	4		
1919 ...	...	...	...	...	...	...	19	82	8	38		

NOTE.—The figures for the current year are approximate only.